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Electron Spin Relaxation: The Role of Spin-Orbit Coupling in Organic Semiconductors M. WILLIS, L. NUCCIO, Queen Mary University of London, L. SCHULZ, University of Texas at Austin, USA, W. GILLIN, T. KREOUZIS, Queen Mary University of London, F. PRATT, J. LORD, ISIS Muon Facility, UK, M. HEENEY, Imperial London, UK, S. FRATINI, Institut Neel Grenoble, FR., C. BERNHARD, University of Fribourg, CH, A. DREW, Queen Mary University of London — Rapid development of organic materials has lead to their availability in commercial products. Until now, the spin degree of freedom has not generally been used in organic materials. As well as engineering difficulties, there are fundamental questions with respect to the electron spin relaxation (eSR) mechanisms in organic molecules. Muons used as a microscopic spin probe, localized to a single molecule, can access information needed to identify the relevant model for eSR. In this presentation I will introduce the ALC-MuSR technique describing how eSR can be extracted and the expected effects. I will show how the technique has been applied to small organic molecules such as the group III Quinolate series and functionalized molecules with a pentacene-like backbone. Lastly I will present the Z-number and temperature dependence in these organic molecules and show strong evidence for a spin-orbit based eSR mechanism.

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